



# NATIONAL ACADEMY OF NEUROPSYCHOLOGY

## CLINICAL NEUROANATOMY SYLLABUS

The goal of this course is to provide students with a working knowledge of the basic neuroanatomic structures of the central nervous system including the motor system, somatosensory system, cranial nerves, cerebellum, basal ganglia, limbic structures, ventricles, meninges, and the vascular supply of the brain. After each major system, structure, or anatomical pathway is presented, the consequences of damage to that system will be presented. These are referred to as “Key Clinical Concepts” in your textbook and throughout these modules. Furthermore, clinical cases will be presented to help solidify the anatomical facts. In this fashion, the neuroanatomical details will take on clinical relevance, and thus a deeper appreciation of how the central nervous system operates will hopefully be attained.

### **COURSE DIRECTOR**

Gregory P. Lee, Ph.D.  
Professor of Neuropsychology & Director of Training  
Barrow Neurological Institute  
Phoenix, AZ

### **REQUIRED MATERIALS**

Blumenfeld, H. (2010). *Neuroanatomy Through Clinical Cases, Second Edition*. Sunderland, MA: Sinauer Associates  
(ISBN: 0878930582)

Note: Students should purchase the Blumenfeld text from the vendor of your choice immediately after registration.

Brain Dissection Video Version 2.0. This will be available for view at the onset of the course.

### **DURATION & CREDITS**

This is a 15-week online learning experience that combines text readings, online material, video, supplemental thought questions, and student-instructor interactions via an online discussion board. The course is divided into seven learning modules, each approximately 2 weeks in duration.

Students who successfully complete all course requirements receive 30 CE credits for psychologists.

The National Academy of Neuropsychology is approved by the American Psychological Association to sponsor continuing education for psychologists. The National Academy of Neuropsychology maintains responsibility for this program and its content.

Instructional Level: Advanced

## **COURSE FEES**

NAN Members: \$465

Non-members: \$775

## **WORKLOAD**

Please note the time commitment to this course. Weekly workload will vary substantially depending on student ability and background in neuroscience. The DistanCE program expects that a MINIMUM workload of 3-4 hours per week is necessary to keep up with the course. Students who have taken the course in the past report that 5-6 hours of work per week is more common.

## **OBJECTIVES**

Upon completion of the course, the learner will:

1. Describe the gross anatomy of the brain, major landmarks, basic organization of the primary and secondary motor and sensory association areas, and the primary relationships between cortex and subcortical structures.
2. Identify the key elements of the neurological examination and describe how neurologists interpret results to infer location and type of disease.
3. Identify the structure and relative location of the ventricles and meninges and compare and contrast the primary clinical conditions associated with their pathology including headache, increased intracranial pressure, herniation syndromes, tumors, and hydrocephalus.
4. Describe the basic anatomy of the spinal cord, motor system, autonomic nervous system, somatosensory pathways, and structure and function of thalamus. Participants will relate these regions to signs and conditions associated with their dysfunction such as hemiparesis, unsteady gait, multiple sclerosis, paresthesias, sensory loss, and pain.
5. Examine the pathways, brainstem nuclei, and methods of assessment of the cranial nerves and list signs and symptoms of their dysfunction including anosmia, eye gaze and pupillary disorders, facial numbness, hearing loss, dizziness, dysarthria, dysphagia and pseudobulbar affect.
6. Analyze and discuss the vascular supply, cytoarchitecture, and major input and output pathways of the cerebellum and review clinical findings and localization of cerebellar lesions and differential diagnosis of ataxia.
7. Analyze the intrinsic connections and input and output pathways of the basal ganglia and

describe their basic functions and signs of dysfunction, especially as related to the movement disorders including Parkinson's disease and Huntington's disease.

8. List and define the major limbic system structures and their interconnections, especially the hippocampus and amygdala, and discuss how lesions of these regions affect memory, emotion, and olfaction.

## **COURSE REQUIREMENTS**

To pass course requirements and earn continuing education credits or certificates of completion students must:

- complete all multiple choice posttest examinations, earning a cumulative percentage >74% correct and
- write a response to at least three (3) of the online Discussion Questions selected from any of the seven modules and post these responses to the online course discussion forum.

The DistanCE online system automatically records performance on multiple-choice exams, which may be taken multiple times.

## **SCHEDULE**

### **Week 1:**

Introduction to Course  
Review of Course Syllabus and Requirements  
Technology Issues/Getting on the DistanCE Website  
Obtaining Materials

### **Week 2:**

Resolve Outstanding Technology Issues  
Begin Module 1: Neuroanatomy Overview and Basic Definitions  
Blumenfeld: Chapter 2: pp. 14 – 46

### **Week 3:**

Complete Module 1: Neuroanatomy Overview and Basic Definitions  
Gross Brain Dissection Video – Dr. Gulati  
Complete Module 1 Quiz  
Blumenfeld: Chapter 2: pp. 14 – 46

### **Week 4:**

Complete Module 2: The Neurological Examination  
Complete Module 2 Quiz  
Blumenfeld: Chapter 3: pp. 50 – 81 and [www.neuroexam.com](http://www.neuroexam.com)

### **Week 5:**

Begin Module 3: Brain & Environs: Cranium, Ventricles, and Meninges  
Blumenfeld: Chapter 5: pp. 126 - 217

**Week 6:**

Complete Module 3: Brain & Environs: Cranium, Ventricles, and Meninges

Complete Module 3 Quiz

Blumenfeld: Chapter 5: pp. 126 - 217

**Week 7:**

Begin Module 4: Corticospinal Tract and Other Motor Pathways

Blumenfeld: Chapter 6: pp. 224 - 270

**Week 8:**

Complete Module 4: Somatosensory Pathways

Complete Module 4 Quiz

Blumenfeld: Chapter 7: pp. 276 - 314

**Week 9:**

Begin Module 5: Visual System

Blumenfeld: Chapter 11: pp. 460 - 490

**Week 10:**

Complete Module 5: Brainstem I: Surface Anatomy & Cranial Nerves

Complete Module 5 Quiz

Blumenfeld: Chapter 12: pp. 494 - 561

**Week 11:**

Begin Module 6: Cerebellum

Blumenfeld: Chapter 15: pp. 698 – 735

**Week 12:**

Complete Module 6: Basal Ganglia

Complete Module 6 Quiz

Blumenfeld: Chapter 16: pp. 740 - 785

**Week 13:**

Begin Module 7: Limbic System: Homeostasis, Olfaction, Memory, and Emotion

Blumenfeld: Chapter 18: pp. 820 - 875

**Week 14:**

Complete Module 7: Limbic System

Complete Module 7 Quiz

Blumenfeld: Chapter 18: pp. 820 – 875

**Week 15:**

Complete Any Outstanding Assignments

Course Evaluation Online